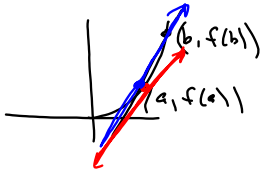


Review 6 Average &amp; Instantaneous Rate of Change

$$\text{Average Rate} = \frac{f(b) - f(a)}{b - a} = \text{slope of secant}$$



$$\text{Instantaneous Rate} = f'(a) = \text{slope of tangent}$$

ave rate approximates the inst. rate

Feb 22-9:48 AM

Ex 1.

Time (min)	0	4	8	12	16
Temp (°C)	65	68	73	80	90

- a) estimate inst. rate at  $t=10$  min  
 b) explain the meaning of the estimate

a)  $\frac{80-73}{12-8} = \frac{7}{4} \frac{^{\circ}\text{C}}{\text{min}}$  b) Temp is increasing by  $\frac{7}{4} \frac{^{\circ}\text{C}}{\text{min}}$  at  $t=10$   
 SDQ

Feb 22-9:54 AM

Ex 2. which of the following best approximates  $\frac{\ln(2+h) - \ln(2)}{h}$  for small values of  $h$ ?  $\approx f'(2)$

- A)  $\ln 2$  B)  $\ln 2 - \ln h$  C)  $\ln\left(\frac{2+h}{h}\right)$  D)  $\frac{1}{2}$  E)  $\frac{1}{2} - \frac{1}{h}$

$$f(x) = \ln(x)$$

$$f'(x) = \frac{1}{x} \Big|_{x=2} = \frac{1}{2}$$

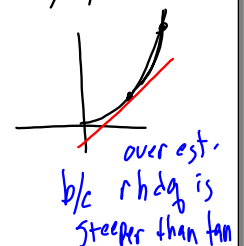
inst rate

Feb 22-10:02 AM

Ex 3. A falling rock travel a distance of  $y = 16t^2$ .

- a) Find the ave velocity on  $[2, 2.1]$   
 b) Is the ave velocity an overest. or an underest of the inst vel. at  $t=2$ ?

a)  $\frac{16(2.1)^2 - 16(2)^2}{.1} = 65.6 \frac{\text{ft}}{\text{sec}}$  b)  $y'(2) = 64$



Feb 22-10:08 AM